

WHAT IS CLAIMED IS:

1. A color solid-state imaging apparatus, comprising:
 - a plurality of pixel devices provided in a plane;
 - a Bayer array color filter which includes first through third color filter segments and which is provided over the plurality of pixel devices, each of the first through third color filter segments corresponding to a respective one of the plurality of pixel devices; and
 - a read pixel position selecting section for selecting read pixel positions such that in two directions crossing each other, a first pixel pair of horizontally-adjacent pixels corresponding to a first color filter segment and one of a second color filter segment and a third color filter segment and a second pixel pair of vertically-adjacent pixels corresponding to a first color filter segment and the one or the other one of a second color filter segment and a third color filter segment are provided so as to alternate with each other, and there are (N-1) pairs of unselected pixels (N is a positive integer) between the alternate first and second pixel pairs.
2. A color solid-state imaging apparatus according to

claim 1, wherein the two directions crossing each other are horizontal and vertical directions.

3. A color solid-state imaging apparatus according to claim 1, wherein the two directions crossing each other are two different diagonal directions.

4. A color solid-state imaging apparatus according to claim 1, wherein the first color filter segment is a green filter segment, the second color filter segment is a red filter segment, and the third filter segment is a blue filter segment.

5. A color solid-state imaging apparatus according to claim 2, wherein, in comparison with a case where data corresponding to all of the pixels is read, a frame rate is the same, and a pixel reading period is increased $2N^2$ times.

6. A color solid-state imaging apparatus according to claim 2, wherein, in comparison with a case where data corresponding to all of the pixels is read, the period of time required for reading one pixel is the same, and the frame rate is increased $2N^2$ times.

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7. A color solid-state imaging apparatus according to claim 2, wherein a series of horizontal reading operations are performed so as to read data corresponding to selected pixels row-by-row, and color signal processing is performed on the data corresponding to selected pixels which is read in two horizontal reading operations.

8. A color solid-state imaging apparatus according to claim 2, wherein a series of horizontal reading operations are performed such that data corresponding to upper and lower pixels alternately selected in two adjacent rows is read in each of the series of horizontal reading operations, and color signal processing is performed on the data corresponding to the alternately-selected pixels which is read in two horizontal reading operations.

9. A color solid-state imaging apparatus according to claim 3, wherein, in comparison with a case where data corresponding to all of the pixels is read, a frame rate is the same, and a pixel reading period is increased $4N^2$ times.

10. A color solid-state imaging apparatus according to claim 3, wherein, in comparison with a case where data corresponding to all of the pixels is read, the period of time required for reading one pixel is the same, and the frame rate is increased $4N^2$ times.

11. A color solid-state imaging apparatus according to claim 3, wherein a series of horizontal reading operations are performed so as to read data corresponding to selected pixels row-by-row, and color signal processing is performed on the data corresponding to selected pixels which is read in three horizontal reading operations.

12. A color solid-state imaging apparatus according to claim 3, wherein a series of horizontal reading operations are performed such that data corresponding to upper and lower pixels alternately selected in two adjacent rows is read in each of the series of horizontal reading operations, and color signal processing is performed on the data corresponding to the alternately-selected pixels which is read in four horizontal reading operations.

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13. An image information apparatus for imaging an object using the color solid-state imaging device according to claim 1.

14. A color solid-state imaging apparatus, comprising:

a plurality of pixel devices arranged in a matrix;

a color filter which includes first through third color filter segments and which is provided over the plurality of pixel devices, the first color filter segments having a first spectral characteristic, the second color filter segments having a second spectral characteristic, and the third color filter segments having a third spectral characteristic, wherein the first color filter segments are provided over every other pixel device in horizontal and vertical directions, and the second and third color filter segments are line-sequentially provided over the remaining pixel devices, in which the first color filter segments are not provided, in separate rows in an alternating manner; and

a read pixel position selecting section for selecting read pixel positions such that the plurality of pixel devices are divided into pixel units in such a manner that each pixel unit consists of four pixel devices

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of the plurality of pixel devices arranged so as to have two horizontally-adjacent pixel devices and two vertically-adjacent pixel devices, a first pixel unit selecting two horizontally-adjacent pixel devices respectively corresponding to a first color filter segment and a second color filter segment, and a second pixel unit selecting two vertically-adjacent pixel devices respectively corresponding to a first color filter segment and a third color filter segment,

wherein, in two directions crossing each other, the first pixel unit and the second pixel unit alternate with each other, and there are (N-1) units of unselected pixels (N is a positive integer) between the alternate first and second units.

15. A color solid-state imaging apparatus according to claim 14, wherein the two directions crossing each other are horizontal and vertical directions.

16. A color solid-state imaging apparatus according to claim 14, wherein the two directions crossing each other are two different diagonal directions.

17. A color solid-state imaging apparatus according to

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20. A color solid-state imaging apparatus according to claim 15, wherein a series of horizontal reading operations are performed so as to read data corresponding to selected pixels row-by-row, and color signal processing is performed on the data corresponding to selected pixels which is read in two horizontal reading operations.

21. A color solid-state imaging apparatus according to claim 15, wherein a series of horizontal reading operations are performed such that data corresponding to upper and lower pixels alternately selected in two adjacent rows is read in each of the series of horizontal reading operations, and color signal processing is performed on the data corresponding to the alternately-selected pixels which is read in two horizontal reading operations.

22. A color solid-state imaging apparatus according to claim 16, wherein, in comparison with a case where data corresponding to all of pixels is read, a frame rate is the same, and a pixel reading period is increased $4N^2$ times.

23. A color solid-state imaging apparatus according to claim 16, wherein, in comparison with a case where data corresponding to all of the pixels is read, the period of time required for reading one pixel is the same, and the frame rate is increased $4N^2$ times.

24. A color solid-state imaging apparatus according to claim 16, wherein a series of horizontal reading

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operations are performed so as to read data corresponding to selected pixels row-by-row, and color signal processing is performed on the data corresponding to selected pixels which is read in three horizontal reading operations.

25. A color solid-state imaging apparatus according to claim 16, wherein a series of horizontal reading operations are performed such that data corresponding to upper and lower pixels alternately selected in two adjacent rows is read in each of the series of horizontal reading operations, and color signal processing is performed on the data corresponding to the alternately-selected pixels which is read in four horizontal reading operations.

26. An image information apparatus for imaging an object using the color solid-state imaging device according to claim 14.

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